SUBSECTION 8.12

Hazardous Materials Handling

8.12 Hazardous Materials Handling

8.12.1 Introduction

This section evaluates the potential effects on human health and the environment from the storage and use of hazardous materials in conjunction with CVEC. Section 8.12.2 presents the LORS applicable to hazardous materials, Section 8.12.3 describes the existing environment that may be affected, and Section 8.12.4 identifies potential impacts on that environment and on human health from CVEC development. Section 8.12.5 discusses the offsite migration modeling protocol, Section 8.12.6 discusses fire and explosion risk. Section 8.12.7 investigates potential cumulative impacts, and Section 8.12.8 presents proposed mitigation measures. Section 8.12.9 describes the agencies involved and provides agency contacts. Section 8.12.10 describes permits required and the permit schedule. Section 8.12.11 provides the references used to develop this section.

8.12.2 Laws, Ordinances, Regulations, and Standards

The storage and use of hazardous materials and acutely hazardous materials at CVEC are governed by federal, state, and local laws. Applicable laws and regulations address the use and storage of hazardous materials to protect the environment from contamination; they are also intended to protect facility workers and the surrounding community from exposure to hazardous and acutely hazardous materials. The applicable LORS are summarized in Table 8.12-1.

8.12.2.1 Federal

Hazardous materials are governed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Clean Air Act (CAA), and the Clean Water Act (CWA).

8.12.2.1.1 CERCLA

The Superfund Amendments and Reauthorization Act of 1986 (SARA), an amendment to CERCLA, governs hazardous materials. The applicable part of SARA for CVEC is Title III, otherwise known as the Emergency Planning and Community Right-To-Know Act of 1986 (EPCRA). Title III requires states to establish a process for developing local chemical emergency preparedness programs and to receive and disseminate information on hazardous materials present at facilities in local communities. The law provides primarily for planning, reporting, and notification concerning hazardous materials. Key sections of the law are:

- Section 302—requires that certain emergency planning activities be conducted when Extremely Hazardous Substances (EHSs) are present in excess of their Threshold Planning Quantities (TPQs). EHSs and their TPQs are found in Appendices A and B of 40 CFR Part 355.
- Section 304—Requires immediate notification to the Local Emergency Planning Committee (LEPC) and the State Emergency Response Commission (SERC) when a hazardous material is released in excess of its Reportable Quantity (RQ). If a CERCLA-listed hazardous substance RQ is released, notification must also be given to the National Response Center in Washington, D.C. (RQs are listed in 40 CFR Part 302, Table 302.4). These notifications are in addition to notifications given to the local emergency response team or fire personnel.
- Section 311—Requires that either material safety data sheets (MSDSs) for all hazardous materials or a list of all hazardous materials be submitted to the SERC, LEPC, and local fire department.
- Section 313—Requires annual reporting of hazardous materials released into the environment either routinely or as a result of an accident.

TABLE 8.12-1
Applicable Laws, Ordinances, Regulations, and Standards

LORS	Purpose	Applicability (AFC Section Explaining Conformance)
Federal		
CERCLA/SARA		
Section 302	Requires certain planning activities when EHS are present in excess of TPQ. CVEC will have ammonia and sulfuric acid in excess of the TPQ.	An RMP will be prepared to describe planning activities. (Section 8.12.8.4).
Section 304	Requires notification when there is a release of hazardous material in excess of its RQ.	An HMBP will be prepared to describe notification and reporting procedures (Section 8.12.8.4).
Section 311	Requires MSDS for every hazardous material to be kept onsite and submitted to SERC, LEPC, and the local fire department.	The HMBP to be prepared will include MSDSs and procedures for submission to agencies (Section 8.12.8.4).
Section 313	Requires annual reporting of releases of hazardous materials.	The HMBP to be prepared will describe reporting procedures (Section 8.12.8.4).
Clean Air Act (CAA)	Requires an RMP if listed hazardous materials are stored at or above a TQ.	An RMP will be prepared (Section 8.12.8.4).
Clean Water Act (CWA)	Requires preparation of an SPCC plan if oil is stored above certain quantities.	An SPCC Plan will be prepared (Section 8.12.8.4).
State		
Health and Safety Code, Section 25500, et seq. (Waters Bill)	Requires preparation of an HMBP if hazardous materials are handled or stored in excess of threshold quantities.	An HMBP will be prepared (Section 8.12.8.4).
CalARP Program. Health and Safety Code, Section 25531 through 25543.4 (La Follette Bill)	Requires registration with local CUPA or lead agency and preparation of an RMP if acutely hazardous materials are handled or stored in excess of TPQs.	An RMP will be prepared that will describe procedures for registration with Fresno County CUPA (Section 8.12.8.4).
Aboveground Petroleum Storage Act	Requires entities that store petroleum in ASTs in excess of certain quantities to prepare an SPCC Plan.	An SPCC Plan will be prepared (Section 8.12.8.4).
Safe Drinking Water and Toxics Enforcement Act (Proposition 65)	Requires warning to persons exposed to a list of carcinogenic and reproductive toxins and protection of drinking water from same toxins.	The site will be appropriately labeled for chemicals on the Proposition 65 list.

TABLE 8.12-1
Applicable Laws, Ordinances, Regulations, and Standards

LORS	Purpose	Applicability (AFC Section Explaining Conformance)
Local		
California Fire Code (1998 version adapted in its entirety by Fresno County Board of Supervisors)	Requires proper storage and handling of hazardous materials	See Sections 8.12.8.1 and 8.12.8.2

AST Aboveground Storage Tank
CalARP California Accidental Release Program
CERCLA Comprehensive Environmental Response, Compensation, and Liability Act
CUPA Certified Unified Program Agency
EHS Extremely hazardous substance
HMBP Hazardous Materials Business Plan
LEPC Local Emergency Planning Committee
MSDS Material Safety Data Sheet
RMP Risk Management Plan
SARA Superfund Amendments and Reauthorization
SERC State Emergency Response Commission
SPCC Spill Prevention Control and Countermeasures
TPQ Threshold Planning Quantity

8.12.2.1.2 CAA

Regulations (40 CFR 68) under the CAA are designed to prevent accidental releases of hazardous materials. The regulations require facilities to develop a Risk Management Plan (RMP), if they store designated materials above threshold quantities. The RMPs must include hazard assessments and response programs to prevent accidental releases of certain chemicals. Section 112(r)(5) of the CAA discusses the regulated chemicals. These chemicals are listed in 40 CFR 68.130. Anhydrous ammonia is a listed substance with a threshold quantity of 10,000 pounds.

8.12.2.1.3 CWA

The Spill Prevention Control and Countermeasures (SPCC) program under the CWA is designed to prevent or contain the discharge or threat of discharge of oil into navigable waters or adjoining shorelines. Regulations under the CWA (40 CFR 112) require facilities to prepare a written SPCC Plan if they store oil and its release would pose a threat to navigable waters. The SPCC program is applicable if a facility has a single oil AST with a capacity greater than 660 gallons, total AST storage greater than 1,320 gallons, or underground storage capacity greater than 42,000 gallons.

Other related federal laws that address hazardous materials but do not specifically address their handling, are the Resource Conservation and Recovery Act (RCRA), which is discussed in Section 8.13, and the Occupational Safety and Health Act (OSHA), which is discussed in Section 8.7.

8.12.2.2 State

California laws and regulations relevant to hazardous materials handling at CVEC include Health and Safety Code Section 25500 (hazardous materials), Health and Safety Code Section 25531 (acutely hazardous materials), and the Aboveground Petroleum Storage Act (petroleum in aboveground tanks).

8.12.2.2.1 Health and Safety Code Section 25500 (Waters Bill)

This law is found in the California Health and Safety Code, Section 25500, et seq., and in the regulations contained in 19 CCR Section 2620, et seq. The law requires local governments to regulate local business storage of hazardous materials in excess of certain quantities. The law also requires that entities storing hazardous materials be prepared to respond to releases. Those using and storing

hazardous materials are required to submit an HMBP to their local administering agency (i.e., CUPA). They must also report releases to their CUPA and the Governor's Office of Emergency Services. The threshold quantities for hazardous materials are 55 gallons for liquids, 500 pounds for solids, and 200 cubic feet for compressed gases measured at standard temperature and pressure.

8.12.2.2.2 Health and Safety Code Section 25531 (La Follette Bill)

This law regulates the registration and handling of acutely hazardous materials, per California Health and Safety Code, Section 25531, et seq. Acutely hazardous materials are any chemicals designated as an extremely hazardous substance by the USEPA as part of its implementation of SARA Title III. The La Follette Bill expands the programs mandated by the Waters Bill and overlaps or duplicates some of the requirements of SARA and the CAA. Facilities handling or storing acutely hazardous materials at or above threshold planning quantities must register with their local CUPA and prepare an RMP. The TPQ for ammonia is 500 pounds.

8.12.2.2.3 Aboveground Petroleum Storage Act

This law is found in the Health and Safety Code at Sections 25270 to 25270.13 and is intended to ensure compliance with the federal CWA. The law applies if a facility has an AST with a capacity greater than 660 gallons or a combined AST capacity greater than 1,320 gallons and if there is a reasonable possibility that the tank(s) may discharge oil in "harmful quantities" into navigable waters or adjoining shore lands. If a facility falls under these criteria, it must prepare an SPCC. The law does not cover AST design, engineering, construction, or other technical requirements, which are usually determined by local fire departments.

8.12.2.2.4 Safe Drinking Water and Toxics Enforcement Act (Proposition 65)

This law identifies chemicals that cause cancer and reproductive toxicity, informs the public, and prevents discharge of the chemicals into sources of drinking water. Lists of the chemicals of concern are published and updated periodically. The Act is administered by California's Office of Environmental Health Hazard Assessment. Some of the chemicals to be used at CVEC are on the cancer-causing and reproductive-toxicity lists of the Act.

8.12.2.3 Local

Local agencies usually have the responsibility for administering hazardous materials requirements and ensuring compliance with federal and state laws. The Fresno County Fire Department and the Fresno County Environmental Health Department are the local agencies with jurisdiction over hazardous materials storage and handling practices. The local requirements that pertain to hazardous materials are discussed below.

8.12.2.3.1 Fresno County

The Fresno County Environmental Health Department (EHD) is the designated Certified Unified Program Agency (CUPA) and is responsible for administering HMBPs/HMMPs, SPCC Plans, and RMPs filed by businesses located in the county. The County is also responsible under the CUPA program for underground storage tank compliance. In addition, the County's EHD is the regulatory body for all hazardous waste generated in the County (see Section 8.13, Waste Management). The County EHD is responsible for ensuring that businesses and industry store and use hazardous materials safely and in conformance with various regulatory codes. EHD performs inspections at established facilities to verify that hazardous materials are properly stored and handled and that the types and quantities of materials reported in a firm's Hazardous Materials Business Plan are accurate.

8.12.2.4 Codes

The design, engineering, and construction of hazardous materials storage and dispensing systems will be in accordance with all applicable codes and standards, including the following:

- California Vehicle Code, 13 CCR 1160, et seq.—Provides the CHP with authority to adopt regulations for the transportation of hazardous materials in California.
- The Uniform Fire Code, Article 80 - The hazardous materials section of the Fire Code. Local fire agencies or departments enforce this code and can require that an HMBP and a Hazardous Materials Inventory Statement be prepared. This requirement and the Waters Bill requirement for an HMBP can usually be satisfied in a single combined document.
- State Building Standard Code, Health and Safety Code Sections 18901 to 18949 -Incorporates the UBC, Uniform Fire Code, and the Uniform Plumbing Code.
- The American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section VIII.
- The American National Standards Institute (ANSI) K61.1.

8.12.3 Affected Environment

The project site is located in an industrial area of the City of San Joaquin in Fresno County (Figure 2.1-1). Land use in the surrounding area (discussed in detail in Sections 8.4 and 8.9) is agricultural and light industrial. The site is designated for manufacturing (industrial) land uses by the City of San Joaquin (City of San Joaquin, 2001). Large infrastructure projects in the area include PG&E's Helm substation and several high-voltage transmission lines. The CVEC site is not located within a FEMA-designated 100-year flood plain (City of San Joaquin, 2001).

There are few sensitive receptor facilities (such as schools, day care facilities, convalescent centers, or hospitals) in the vicinity of the project site. The nearest sensitive receptor is an elementary school library located just under 1.0 mile northwest of the project site. There are also a few residences (primarily farmers) in the vicinity of the site. The nearest residence is more than 1/4 mile from the site (greater than 1,500 feet). Sensitive receptors within a 3-mile radius of the project site are shown on Figure 8.6-1 (see Section 8.6), and descriptions of the receptors are presented in Table 8.12-2.

TABLE 8.12-2
Sensitive Receptors within a 3-mile Radius of the CVEC Site

Sensitive Receptor Type	Map No.[a]	Name	Telephone Number	Address
Schools	2	San Joaquin Elementary	(559) 693-4321	8535 South 9th Street, San Joaquin, CA 93660
Schools	2	San Joaquin Head Start	(559) 693-4571	8535 South 9th Street, San Joaquin, CA 93660
Schools	1	Golden Plains Unified Alt Ed	(559) 693-2401	22000 Nevada Ave., San Joaquin, CA 93660

[a] See Figure 8.6-1

8.12.4 Potential Environmental and Human Health Effects

Hazardous materials to be used at CVEC during construction and operation were evaluated for hazardous characteristics. That evaluation is discussed in this section. Some of these materials will be stored at the generating site continuously. Others will be brought onsite for the initial startup and periodic maintenance (every 3 to 5 years). Some materials will be used only during startup.

Hazardous materials will not be stored or used in the gas supply line, water supply line, or electric transmission line corridors during operations. Storage locations are described in Table 8.12-3. Table 8.12-4 presents information about these materials, including trade names; chemical names; Chemical Abstract Service (CAS) numbers; maximum quantities onsite; reportable quantities (RQs); La Follette Bill threshold planning quantities (TPQs); and status as a Proposition 65 chemical (a chemical known to be carcinogenic or cause reproductive problems in humans). Toxicity characteristics and the exposure level criteria for acutely hazardous chemicals are shown in Table 8.12-5. Health hazards and flammability data are summarized in Table 8.12-6. Table 8.12-6 also contains information on incompatible chemicals (e.g., sodium hypochlorite and ammonia). Measures to mitigate the potential effects from the hazardous materials are presented in Section 8.12.8.

8.12.4.1 Construction Phase

During construction of the project and linears, acutely hazardous materials, as defined in California's Health and Safety Code, Section 25531, will not be used. Therefore, no discussion of acutely hazardous materials storage or handling is included in this section.

Hazardous materials to be used during construction of the project and its associated linear facilities will include gasoline, diesel fuel, motor oil, hydraulic fluid, solvents, cleaners, sealants, welding flux, various lubricants, paint, and paint thinner. There are no feasible alternatives to motor fuels and oils for operating construction equipment. The types of paint required are dictated by the types of equipment and structures that must be coated and by the manufacturers' requirements for coating.

The quantities of hazardous materials that will be onsite during construction are small, relative to the quantities used during operation. Construction personnel will be trained to handle the materials properly. The most likely possible incidents will involve the potential for fuels, oil, and grease dripping from construction equipment. The small quantities of fuel, oil, and grease that might drip from construction equipment will have relatively low toxicity and will be biodegradable. Therefore, the expected environmental impact is minimal.

Small oil spills may also occur during onsite refueling. Equipment refueling will be performed away from water bodies to prevent contamination of water in the event of a fuel spill. Therefore, the potential environmental effects from fueling operations are expected to be limited to small areas of contaminated soil. If a fuel spill occurs on soil, the contaminated soil will be placed into barrels or trucks for offsite disposal as a hazardous waste. The worst-case scenario for a chemical release from fueling operations would be a vehicle accident involving a service or refueling truck. Handling procedures for the hazardous materials to be used onsite during construction are presented in Section 8.12.8.1.

The quantities of hazardous materials that will be handled during construction are relatively small and Best Management Practices (BMPs) will be implemented by contractor personnel. Therefore, the potential for environmental effects is expected to be small.

8.12.4.2 Operations Phase

Several hazardous materials, including three acutely hazardous materials, will be stored at the generating site during CVEC operation. Most of the hazardous materials that will be stored onsite are corrosive and are a threat to humans, particularly workers at the site, if inhaled, ingested, or contacted by skin. The hazardous characteristics of materials being used at the site are summarized in Table 8.12-6. Table 8.12-6 also contains information on incompatible chemicals (e.g., sodium hypochlorite and ammonia). Mixing incompatible chemicals can generate toxic gases. Measures to keep incompatible chemicals separated include separate storage and containment areas and/or berming (see Section 8.12.8).

TABLE 8.12-3
Use and Location of Hazardous Materials

Chemical	Use	Storage Location	State	Type of Storage
Ammonium Bifluoride	Cleaning of HRSG, initial startup and once every 3 to 5 years	Near each HRSG	Solid Crystals	Initial Startup and Periodically Onsite
Anhydrous Ammonia (99% NH_3)	Control oxides of nitrogen (NO_x) emissions through selective catalytic reduction	Outside, east of the easternmost HRSG	Liquid	Continuously Onsite
Anti-Foam (e.g., NALCO 71 D5 ANTIFOAM)	Brine concentrator to control foaming	Water treatment facility	Liquid	Continuously Onsite
Antifreeze	Closed loop cooling systems	Water treatment facility	Liquid	Continuously Onsite
Calcium Sulfate	Brine concentrator initial startup seeding	Water treatment facility	Solid	Initial Startup and Periodically Onsite
Chelating Agents (EDTA)	Brine concentrator cleaner	Water treatment facility	Liquid	Continuously Onsite
Citric Acid	Cleaning of HRSG, initial startup and once every 3 to 5 years	Near each HRSG	Solid Powder	Initial Startup and Periodically Onsite
Cleaning chemicals/detergents	Periodic cleaning of HRSG and combustion turbine	Water treatment facility/laboratory/maintenance shop	Liquid	Continuously Onsite
Coagulant Aid Polymer (e.g., NALCO NALCOLYTE 8799)	Coagulant for plant makeup water	Water treatment facility	Liquid	Continuously Onsite
Diesel No. 2	Fuel for fire pump engine/vehicles	Near fire pump	Liquid	Continuously Onsite
Disodium Phosphate (Na_2HPO_4)	Boiler water alkalinity control	Water treatment facility/laboratory	Granular Solid	Continuously Onsite
Filter Aid Polymer (e.g., NALCO NALCLEAR 7763)	Used for multi-media filter maintenance	Water treatment facility	Liquid	Continuously Onsite
Formic acid	Cleaning of HRSG	Near each HRSG	Liquid	Prior to Initial Startup
Hydraulic Oil	High-pressure combustion turbine starting system, turbine control valve actuators	Contained within equipment	Liquid	Continuously Onsite
Hydrochloric Acid	Cleaning of HRSG, initial startup and once every 3 to 5 years; small quantity kept onsite for maintenance	Near each HRSG and Water treatment facility	Liquid	Initial Startup and Periodically Onsite; Small quantity continuously onsite

TABLE 8.12-3
Use and Location of Hazardous Materials

Chemical	Use	Storage Location	State	Type of Storage
Hydrogen	Cooling medium for steam turbine hydrogen-cooled generator	Outside, east of HRSGs	Gas	Continuously Onsite
Hydroxyacetic acid	Cleaning of HRSGs; small quantity kept onsite for maintenance	Near each HRSG and Water treatment facility	Solid Crystals	Prior to Initial Startup; Small quantity continuously onsite
Laboratory reagents	Water/wastewater laboratory analysis	Water treatment facility/laboratory	Liquid and Granular Solid	Continuously Onsite
Lubrication Oil	Lubricate rotating equipment (e.g., gas turbine and steam turbine bearings)	Contained within equipment	Liquid	Continuously Onsite
Mineral Insulating Oil	Transformers/switchyard	Contained within transformers and switches	Liquid	Continuously Onsite
Neutralizing amines (e.g., NALCO 356)	Corrosion control of condensate piping	Near main steam pipes of HRSG boilers	Liquid	Continuously Onsite
Non-Oxidizing Biocide (e.g., NALCO 7330)	Cooling tower biological control	Cooling tower chemical facility	Liquid	Continuously Onsite
Oxygen Scavenger (e.g., NALCO ELIMIN-OX)	Oxygen scavenger for use in process feedwater to deaerator	Water treatment facility	Liquid	Continuously Onsite
Phosphonate (e.g., NALCO 7385)	Antiscalant for use in reverse osmosis unit	Water treatment facility	Liquid	Continuously Onsite
Scale Inhibitor (Polyacrylate)	Cooling tower scale inhibitor	Cooling tower chemical facility	Liquid	Continuously Onsite
Sodium Bisulfite or Sodium Sulfite	Dechlorination of reverse osmosis feedwater	Water treatment facility	Liquid	Continuously Onsite
Sodium Bromide	Cooling tower biocide and process water pretreatment	Cooling tower chemical facility and water treatment facility	Liquid	Continuously Onsite
Sodium Carbonate	Cleaning of HRSG, initial startup and once every 3 to 5 years	Water treatment facility and near each HRSG	Solid Powder	Initial Startup and periodically Onsite
Sodium Hexameta Phosphate	Boiler water alkalinity control	Water treatment facility/laboratory	Granular Solid	Continuously Onsite

TABLE 8.12-3
Use and Location of Hazardous Materials

Chemical	Use	Storage Location	State	Type of Storage
Sodium Hydroxide (NaOH)	Demineralizer resin regeneration (if onsite regeneration used), pH neutralization, and reactor clarifier/softener chemical	Water treatment facility/laboratory	Liquid	Continuously Onsite
Sodium Hypochlorite (NaOHCl)	Biocide for circulating water system and process water pretreatment	Cooling tower chemical facility and water treatment facility	Liquid	Continuously Onsite
Sodium Nitrate	Cleaning of HRSG, initial startup and once every 3 to 5 years	Near each HRSG	Solid Crystals	Initial Startup and Periodically Onsite
Sodium Nitrite	Chemical cleaning of heat recovery steam generators	Outside near heat recovery steam generators	Solid	Initial startup and periodically onsite
Sodium Sulfate	Brine concentrator water chemistry adjustment	Water treatment facility	Solid	Continuously Onsite
Stabilized Bromine (e.g., NALCO STABREX ST70)	Biocide for circulating water system and process water pretreatment	Cooling tower chemical facility and water treatment facility	Liquid	Continuously Onsite
Sulfur Hexafluoride	Switch gear devices	Contained within equipment	Liquid	Continuously Onsite
Sulfuric Acid (H_2SO_4)	Circulating water pH control, demineralizer resin regeneration (if onsite regeneration used), pH neutralization	Outside, near cooling tower chemical facility and water treatment facility	Liquid	Continuously Onsite
Trisodium Phosphate (Na_3PO_4)	Boiler water alkalinity control	Water treatment facility/laboratory	Granular Solid	Continuously Onsite

TABLE 8.12-4
CVEC Chemical Inventory

Trade Name	Chemical Name	CAS Number	Maximum Quantity Onsite	CERCLA SARA RQ[a]	RQ of Material as Used Onsite[b]	LaFollette Bill TPQ[c]	Prop 65
Acutely Hazardous Materials							
Anhydrous Ammonia	Anhydrous Ammonia	7664-41-7 (NH_3)	24,000 gal.	100 lb.	100 lb.	500 lb.	No
Neutralizing Amines (e.g., NALCO 356)	Cyclohexylamine (20 to 40%)	108-91-8	800 gal.	10,000 lb.	25,000 lb.	10,000 lb.	No
	Morpholine (5 to 10%)	110-91-8		[d]	[d]	[d]	No
Sulfuric Acid	Sulfuric Acid (93%)	7664-93-9	16,000 gal.	1,000 lb.	1,075 lb.	1,000 lb.	No
Hazardous Materials							
Ammonium Bifluoride	Ammonium Bifluoride	1341-49-7	200 pounds initially and once every 3 to 5 years	100 lb.	100 lb.	[d]	No
Anti-Foam (e.g., NALCO 71 D5 ANTIFOAM)	Hydrotreated light distillate (10-20%)	6742-47-8	800 gal.	[d]	[d]	[d]	No
	n-Decanol (1-5%)	112-30-1		[d]	[d]	[d]	No
	n-Octanol (5-10%)	118-87-5		[d]	[d]	[d]	No
Antifreeze	Propylene Glycol	57-55-6	55 gal.	[d]	[d]	[d]	No
Calcium Sulfate	Calcium Sulfate	10101-41-4	4,000 lbs.	[d]	[d]	[d]	No
Chelating Agents	Ethylenediaminetetra-acetic acid (EDTA)	60-00-4	55 gal.	5,000 lb.	5,000 lb.	[d]	No
Citric Acid	Citric Acid	77-92-9	100 lb.	[d]	[d]	[d]	No
Cleaning Chemicals/Detergents	Various	None	100 gal.	[d]	[d]	[d]	No
Coagulant Aid Polymer (e.g., NALCO NALCOLYTE 8799)	Polyquaternary Amine	20507700000-5062P	800 gal.	[d]	[d]	[d]	No

TABLE 8.12-4
CVEC Chemical Inventory

Trade Name	Chemical Name	CAS Number	Maximum Quantity Onsite	CERCLA SARA RQ[a]	RQ of Material as Used Onsite[b]	LaFollette Bill TPQ[c]	Prop 65
Diesel No. 2	Oil	None	500 gal.	42 gal.[e,f]	42 gal.[e,f]	[d]	Yes
Disodium Phosphate	Sodium Phosphate, Dibasic	7558-79-4	500 lb.	5,000 lb.	5,000 lb.	[d]	No
Filter Aid Polymer (e.g., NALCO NALCLEAR 7763)	Hydrotreated light distillate	64742-47-8	800 gal.	[d]	[d]	[d]	No
	Ethoxylated C10-16 Alcohols	68002-97-1		[d]	[d]	[d]	No
	Acrylic Polymer	20507700000-5027P		[d]	[d]	[d]	No
Formic Acid	Formic Acid	64-18-6	600 pounds prior to startup; 100 gals on a regular basis	5,000 lb.	5,000 lb.	[d]	No
Hexametaphosphate	Sodium Hexametaphospate	10124-56-8	500 lb.	[d]	[d]	[d]	No
Hydraulic Oil	Oil	None	1, 000 gal.	42 gal.[e,f]	42 gal.[e,f]	[d]	No
Hydrochloric Acid	Hydrochloric Acid (30%)	7647-01-0	10,000 pounds initially and once every 3 to 5 years; 55 gal. on a regular basis	5,000 lb.	16,667 lb.	[d]	No
Hydrogen	Hydrogen	1333-74-0	1,320 lb.	[d]	[d]	10, 000 lb.	No
Hydroxyacetic Acid	Gyrolic Acid	None	1000 pounds prior to startup; 100 gals on a regular basis	[d]	[d]	[d]	No
Laboratory Reagents (liquid)	Various	None	10 gal.	[d]	[d]	[d]	No

TABLE 8.12-4
CVEC Chemical Inventory

Trade Name	Chemical Name	CAS Number	Maximum Quantity Onsite	CERCLA SARA RQ[a]	RQ of Material as Used Onsite[b]	LaFollette Bill TPQ[c]	Prop 65
Laboratory Reagents (solid)	Various	None	100 lb.	[d]	[d]	[d]	No
Lubrication Oil	Oil	None	30,000 gal.	42 gal.[e,f]	42 gal.[e,f]	[d]	Yes
Mineral Insulating Oil	Oil	8012-95-1	100,000 gal.	42 gal.[e,f]	42 gal.[e,f]	[d]	Yes
Non-Oxidizing Biocide (e.g., NALCO 7330)	5-Chloro-2-Methyl-4-Isothiazolin-3-one (1.1%)	26172-55-4	800 gal.	[d]	[d]	[d]	No
	2-Methyl-4-Isothiazolin-3-one (0.3%)	2682-20-4		[d]	[d]	[d]	No
Oxygen Scavenger (e.g., NALCO ELIMIN-OX)	Carbohydrazide	497-18-7	800 gal.	[d]	[d]	[d]	No
Phosphonate (e.g., NALCO 7385)	2-Phosphono-1,2,4-Butanetricarboxylic acid (45-50%)	37971-36-1	800 gal.	[d]	[d]	[d]	No
Scale Inhibitors (various)	Polyacrylate	Various	3,000 gal.	[d]	[d]	[d]	No
Sodium Bisulfite (e.g., NALCO 7408)	Sodium Bisulfite (40 to 70%)	7631-90-5	800 gal.	5,000 lb.	7,143 lb.	[d]	No
Sodium Bromide	Sodium Bromide	7647-15-6	2,000 gal.	[d]	[d]	[d]	No
Sodium Carbonate (Soda Ash)	Sodium Carbonate	497-19-8	50 tons	[d]	[d]	[d]	No
Sodium Hydroxide	Sodium Hydroxide (50%)	1310-73-2	8,000 gal.	1,000 lb.	2,000 lb.	[d]	No
Sodium Hypochlorite (Bleach)	Sodium Hypochlorite (10%)	7681-52-9	8,000 gal.	100 lb.	1,000 lb.	[d]	No
Sodium Nitrate	Sodium Nitrate	7631-99-4	500 pounds initially and once every 3 to 5 years	[d]	[d]	[d]	No
Sodium Nitrite	Sodium Nitrite	7632-00-0	500 lb.	100 lb.	100 lb.	[d]	No

TABLE 8.12-4
CVEC Chemical Inventory

Trade Name	Chemical Name	CAS Number	Maximum Quantity Onsite	CERCLA SARA RQ[a]	RQ of Material as Used Onsite[b]	LaFollette Bill TPQ[c]	Prop 65
Sodium Sulfate	Sodium Sulfate	7757-82-6	4,000 lb.	[d]	[d]	[d]	No
Sodium Sulfite	Sodium Sulfite	7757-83-7	800 gal.	[d]	[d]	[d]	No
Stabilized Bromine (NALCO STABREX ST70)	Sodium Hydroxide (1 to 5%) Sodium Hypobromite (10 to 50%)	1310-73-2 13824-96-9	2,000 gal.	1,000 lb. [d]	20,000 lb. [d]	[d]	No No
Sulfur Hexafluoride	Sulfur Hexafluoride	2551-62-4	200 lb.	[d]	[d]	[d]	No
Trisodium Phosphate	Sodium Phosphate, Tribasic	7601-54-9	500 lb.	5,000 lb.	5,000 lb.	[d]	No

[a] Reportable quantity for a pure chemical, per the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) [Ref. 40 CFR 302, Table 302.4]. Release equal to or greater than RQ must be reported. Under California law, any amount that has a realistic potential to adversely affect the environment or human health or safety must be reported.

[b] Reportable quantity for materials as used onsite. Since some of the hazardous materials are mixtures that contain only a percentage of a reportable chemical, the reportable quantity of the mixture can be different than for a pure chemical. For example, if a material only contains 10% of a reportable chemical and the RQ is 100 lbs., the reportable quantity for that material would be (100 lbs.)/(10%) = 1,000 lbs.

[c] Threshold Planning Quantity [Ref. 40 CFR Part 355, Appendix A]. If quantities of extremely hazardous materials equal to or greater than TPQ are handled or stored, they must be registered with the local Administering Agency.

[d] No reporting requirement. Chemical has no listed RQ or TPQ.

[e] State reportable quantity for oil spills that will reach California state waters [Ref. CA Water Code Section 13272(f)]

[f] Per the California Water Quality Control Board Region 5, they would like all oil spills to surface water reported, even if they are less than the state reportable quantity of 42 gallons.

TABLE 8.12-5
Acutely Hazardous Materials

Name	Toxic Effects	Exposure Levels
Anhydrous Ammonia	Toxic effects for contact with pure liquid or vapor causes eye, nose, and throat irritation, skin burns, and vesiculation. Ingestion or inhalation causes burning pain in mouth, throat, stomach, and thorax, constriction of thorax, and coughing followed by vomiting blood, breathing difficulties, convulsions, and shock. Other symptoms include dyspnea, bronchospasms, pulmonary edema, and pink frothy sputum. Contact or inhalation overexposure can cause burns of the skin and mucous membranes, and headache, salivation, nausea, and vomiting. Other symptoms include labored breathing, bloody mucous discharge, bronchitis, laryngitis, hemmoptysis, and pneumonitis. Damage to eyes may be permanent, including ulceration of conjunctiva and cornea and corneal and lenticular opacities.	Occupational Exposures PEL = 35 mg/m3 OSHA TLV = 18 mg/m3 ACGIH TWA = 18 mg/m3 NIOSH STEL = 35 mg/m3 Hazardous Concentrations IDLH = 300 ppm LD_{50} = 350 mg/kg - oral, rat ingestion of 3 to 4 ml may be fatal Sensitive Receptors ERPG-1 = 25 ppm ERPG-2 = 200 ppm ERPG-3 = 1,000 ppm
Sulfuric Acid	Irritates eyes, nose, and throat. Ingestion and inhalation may cause pulmonary edema, bronchitis, emphysema, conjunctivitis, stomatis, dental erosion, and tracheobronchitis. Contact causes severe burns of the skin and eyes, and dermatitis.	Occupational Exposures PEL = 1 mg/m3 OSHA STEL = 3 mg/m3 Hazardous Concentrations IDLH = 80 mg/m3 TCLO = 3 mg/m3/24 weeks inhalation human LDLO = 135 mg/kg – man Sensitive Receptors ERPGs = Not Available
Cyclohexylamine	Caustic/corrosive to skin, eyes, and mucous membranes. Systemic effects include nausea, vomiting, anxiety, restlessness, and drowsiness.	Occupational Exposures PEL = 40 mg/m3 OSHA TLV = 40 mg/m3 ACGIH TWA = 10 ppm STEL = None set Hazardous Concentrations LD_{50} = 779 mg/kg – oral, albino rates LD_{50} = 2,055 mg/kg – dermal, albino rabbits Sensitive Receptors ERPGs = Not Available

ACGIH	American Conference of Government Industrial Hygienists
ERPG	Emergency Response Planning Guideline
ERPG-1	Maximum airborne concentration below which nearly all individuals could be exposed for up to 1 hour without experiencing other than mild transient adverse health effects
ERPG-2	Maximum airborne concentration below which nearly all individuals could be exposed for up to 1 hour without developing irreversible or serious health effects
ERPG-3	Maximum airborne concentration below which nearly all individuals could be exposed for up to 1 hour without experiencing life-threatening health effects
IDLH	Immediately dangerous to life and health
LD_{50}	Dose lethal to 50 percent of those tested
LDLO	Lowest published lethal dose
mg/kg	Milligrams per kilogram
mg/m^3	Milligrams per cubic meter
NIOSH	National Institute of Occupational Safety and Health
PEL	OSHA permissible exposure limit for 8-hr workday
ppm	parts per million
STEL	Short-term exposure limit, 15-min. exposure
TCLO	Lowest published toxic concentration
TLV	ACGIH threshold limit value for 8-hr workday
TWA	NIOSH time-weighted average for 8-hr workday

TABLE 8.12-6
Toxicity of Hazardous and Acutely Hazardous Materials

Hazardous Materials	Physical Description	Health Hazard	Reactive & Incompatibles	Flammability[a]
Anhydrous Ammonia	Colorless gas with pungent odor	*Corrosive*: Irritation to permanent damage from inhalation, ingestion, and skin contact.	Acids, halogens (e.g., chlorine), strong oxidizers, salts of silver and zinc.	Combustible, but difficult to burn
Ammonium Bifluoride	White crystals	*Corrosive, Toxic*: Caustic poison and strong irritant.	None.	Non-flammable
Anti-Foam (e.g., NALCO 71 D5 Antifoam)	Clear, light yellow	Causes irritation to skin and eyes	Strong oxidizers (e.g., chlorine, peroxides, chromates, nitric acid, perchlorates, concentrated oxygen, permaganates)	Combustible
Antifreeze	Colorless, odorless viscous liquid	Causes irritation	Strong oxidizing agents	Combustible
Calcium Sulfate	White granules; odorless	May cause impaired sense of smell and taste, respiratory tract irritation, dermatitis and conjunctivitis	Diazomethane (vapor) and Phosphorous (red)	Non-flammable
Chelating Agent (EDTA)	White powder, odorless	Dust may be irritating to eyes and mucous membranes	None specified	Non-flammable
Citric Acid	Translucent crystals	None.	None.	Non-flammable
Cleaning Chemicals/Detergents	Liquid	Refer to individual chemical labels.	Refer to individual chemical labels.	Refer to individual chemical labels
Coagulant Aid Polymer (e.g., NALCO NALCOLYTE 8799)	Liqht yellow liquid	May cause irritation to skin and eyes with prolonged contact.	Strong oxidizers	Non-flammable
Diesel No. 2	Oily, light liquid	May be carcinogenic.	Sodium hypochlorite.	Flammable
Disodium Phosphate	White powder	*Toxic*: Toxic by ingestion.	None.	Non-flammable
Oxygen Scavenger (e.g., NALCO ELIMIN-OX)	Colorless liquid	*Toxic*: Slightly toxic, low human hazard.	Mineral acids, nitrites, and strong oxidizers.	Non-flammable
Filter Aid Polymer (e.g., NALCO NALCLEAR 7763)	Off-white/opaque liquid	May cause irritation to skin and eyes with prolonged contact.	Water and strong oxidizers	Non-flammable

TABLE 8.12-6
Toxicity of Hazardous and Acutely Hazardous Materials

Hazardous Materials	Physical Description	Health Hazard	Reactive & Incompatibles	Flammability[a]
Formic Acid	Colorless, fuming liquid	*Corrosive*: Irritant to skin and tissue.	Strong oxidizers, strong caustics, concentrated sulfuric acid.	Combustible
Hydraulic Oil	Oily, dark liquid	Hazardous if ingested.	Sodium hypochlorite.	Combustible
Hydrochloric Acid	Colorless, pungent, fuming liquid	*Strongly Corrosive and Toxic*: Toxic by ingestion. Strong irritant to eyes and skin.	Metals, hydroxides, amines, alkalis.	Non-flammable
Hydrogen	Colorless gas	May cause nausea, vomiting, dizziness, tingling sensation, suffocation, convulsions, or coma	Metals, oxidizing materials, metal oxides, combustible materials, halogens, metal salts, or halocarbons and heat, flames, or other sources of ignition.	Flammable
Hydroxyacetic Acid	Colorless crystals	*Corrosive and Toxic*: Toxic by inhalation, ingestion, and dermal contact. Irritant to skin and tissue.	Strong bases, strong reducing and oxidizing agent.	Combustion is possible at elevated temperatures or if in contact with an ignition source
Laboratory Reagents	Liquid and solid	Refer to individual chemical labels.	Refer to individual chemical labels.	Refer to individual chemical labels
Lubrication Oil	Oily, dark liquid	Hazardous if ingested.	Sodium hypochlorite.	Flammable
Mineral Insulating Oil	Oily, clear liquid	Minor health hazard.	Sodium hypochlorite.	Can be combustible, depending on manufacturer
Neutralizing Amine (e.g., NALCO 356)	Clear, light yellow/green liquid	*Corrosive*: Irritation to eyes and skin. Can cause kidney damage.	Strong oxidizers and acids. SO_2 or acidic bisulfite products.	Flammable
Non-Oxidizing Biocide (e.g., NALCO 7330)				
Phosphonate (e.g., NALCO 7385)	Colorless liquid	May cause skin or eye irritation with prolonged contact	Strong alkalies (e.g., ammonia and its solutions, carbonates, sodium hydroxide (caustic), potassium hydroxide, calcium hydroxide (lime), cyanide, sulfide, hypochlorites, chorites), and metals.	Non-flammable

TABLE 8.12-6
Toxicity of Hazardous and Acutely Hazardous Materials

Hazardous Materials	Physical Description	Health Hazard	Reactive & Incompatibles	Flammability[a]
Scale Inhibitors (various)	Yellow green liquid	*Corrosive and Toxic*: Slight to moderate toxicity. Irritation to skin and eyes.	Strong acids.	Non-flammable
Sodium Bisulfite	Yellow liquid	*Corrosive:* Irritation to eyes, skin, and lungs. May be harmful if digested	Strong acids and strong oxidizing agents	Non-flammable
Sodium Bromide	White crystals, granules, or powder; odorless	Causes irritation to skin, eyes, and respiratory tract. Can cause damage to central nervous system if ingested.	Acids, alkaloidal and heavy metal salts, oxidizers, and bromine trifluoride	Non-flammable
Sodium Carbonate	White crystals or powder	*Corrosive and Toxic:* Mildly toxic by ingestion. Irritation to skin and eyes.	Aluminum, Phosphorus (V) Oxide, Sulfuric Acid, Fluorine, Lithium, 2,4,6-trinitrotoluene.	Non-flammable
Sodium Hexametaphosphate	White odorless powder	Skin, eye, and mucous membrane irritant. Ingestion may cause nausea, vomiting, or diarrhea	None documented	Non-flammable
Sodium Hydroxide	Clear yellow liquid	*Corrosive*: Irritant to tissue in presence of moisture. Strong irritant to tissue by ingestion.	Water, acids, organic halogens, some metals.	Non-flammable
Sodium Hypochlorite (Bleach)	Pale green; sweet, disagreeable odor. Usually in solution with H_2O or sodium hydroxide.	*Corrosive and Toxic*: Toxic by ingestion. Strong irritant to tissue.	Ammonia and organic materials.	Fire risk when in contact with organic materials
Sodium Nitrate	Colorless Crystals	*Toxic*: Mildly toxic by ingestion.	Acetic Anhydride, Aluminum Powder, Antimony Powder, Barium Thiocyanate, Cyanides, Bitumen, Boron Phosphide, Magnesium, Metal Amidosulfates, Organic Matter, Perosyformic Acid, Sodium Hypophosphite, Wood.	Non-flammable
Sodium Nitrite	White or slightly yellow, hygroscopic; odorless	Causes irritation of skin, eyes, and respiratory tract.	Acids, ammonium compounds, reducing agents, high heat, and sources of ignition	Non-combustible
Sodium Sulfate	White granular solid with no odor	*Toxic:* Causes irritation of skin, eyes, and respiratory tract. May be harmful if swallowed. Potential carcinogen.	Aluminum powder and molten sodium sulfate	Non-flammable

TABLE 8.12-6
Toxicity of Hazardous and Acutely Hazardous Materials

Hazardous Materials	Physical Description	Health Hazard	Reactive & Incompatibles	Flammability[a]
Sodium Sulfite	White crystals or powder with no odor	May cause irritation of skin, eyes, and mucous membranes. Ingestion may cause gastrointestinal irritation.	Strong oxidizing agents and strong acids	Non-flammable
Stabilized Bromine (e.g., NALCO STABREX ST70)	Clear, light yellow liquid.	*Corrosive*: Irritant to eyes and skin. Harmful if ingested or inhaled.	Strong acids. Organic materials. Sodium hypochlorite.	Non-flammable
Sulfur Hexafluoride	Colorless gas with no odor.	Hazardous if inhaled.	Disilane.	Non-flammable
Sulfuric Acid	Colorless, dense, oily liquid.	*Strongly Corrosive*: Strong irritant to all tissue. Minor burns to permanent damage to tissue.	Organic materials, chlorates, carbides, fulminates, metals in powdered form. Reacts violently with water.	Non-flammable
Trisodium Phosphate	Colorless crystals.	*Corrosive and Toxic*: Toxic by ingestion. Irritant to tissue.	None.	Non-flammable

Data was obtained from Material Safety Data Sheets (MSDSs) and "*Hazardous Chemical Desk Reference*, 2nd Edition", by Richard J. Lewis, Sr. (1991).

[a] Per Department of Transportation regulations, under 49 CFR 173: "Flammable" liquids have a flash point less than or equal to 141°F; "Combustible" liquids have a flash point greater than 141° F.

Potential environmental and/or human health effects could be caused by accidental releases, accidental mixing of incompatible chemicals, fires, and injury to facility personnel from contact with a hazardous material. The accidental release of the acutely hazardous material anhydrous ammonia might present the most serious potential for effects on the environment and/or human health.

Pure ammonia (NH_3) is a volatile, acutely hazardous chemical that is stored under pressure as a liquid and becomes a toxic gas if released. The odor threshold of ammonia is about 5 ppm, and minor irritation of the nose and throat will occur at 30 to 50 ppm. Concentrations greater than 140 ppm will cause detectable effects on lung function even for short-term exposures (0.5 to 2 hours).

At higher concentrations of 700 to 1,700 ppm, ammonia gas will cause severe effects; death occurs at concentrations of 2,500 to 7,000 ppm. The hazard to facility workers will be mitigated by facility safety equipment, hazardous materials training, and emergency response planning (see Section 8.7, Worker Health and Safety). In a catastrophic accident, toxic ammonia gas could migrate offsite and affect the health of humans at locations surrounding the facility (see Section 8.12.5). Facility design will minimize the potential for harm to humans located offsite (see Section 8.12.8.2).

Neutralizing amines (e.g., NALCO 356) contain cyclohexylamine, which is classified as an acutely hazardous material. Cyclohexylamine is corrosive to the eyes and skin and, depending on the length of exposure, can cause permanent eye damage and third degree burns to the skin. However, this chemical is not particularly volatile, and is soluble in water, which constitutes 50 to 75 percent of NALCO 356. The maximum quantity of neutralizing amines stored onsite will be 800 gallons and the maximum quantity of pure cyclohexylamine will be 320 gallons. Because of the low volatility of these chemicals and the relatively small quantities stored, the offsite threat is considered small.

Sulfuric acid, a hazardous material, is a very corrosive chemical that can cause severe harm to humans if ingested, inhaled, or contacted. However, sulfuric acid has a very low vapor pressure and will not readily volatilize upon release. Therefore, the potential for harm to humans offsite is minimal.

The remaining materials in Table 8.12-4 are also considered to be hazardous, but they pose less threat to humans than anhydrous ammonia, cyclohexylamine, and sulfuric acid. Some materials (ammonium bifluoride, citric acid, sodium carbonate, and sodium nitrate) will be used at the site only during initial startup and during periodic maintenance (once every 3 to 5 years). Therefore, the potential for environmental or health effects will exist only during those rare occasions when the materials are onsite.

8.12.5 Offsite Migration Modeling

Because there is some human activity in the vicinity of the proposed CVEC site, a vulnerability analysis is presented in Appendix 8.12A. The analysis assesses the risk to humans at various distances from the site if a spill or rupture of the anhydrous ammonia storage tank were to occur or if a spill from the supply truck were to occur while refilling the storage tank. It also assesses the risks associated with transportation of anhydrous ammonia.

The worst-case scenario for modeling assumes one of the anhydrous ammonia storage tanks is punctured, and the entire contents are released over a 10-minute span into a catch basin or bermed area located beneath the tank that will contain the entire contents of the tank. Other parameters include an atmospheric stability classification of “F” and a wind speed of 1.0 meter/second. Concentric distributions of the ammonia plume are presented at concentrations of 75 and 212 ppm (see Figure 8.12-1). Based upon the modeling results, the risk of exposure to anhydrous ammonia from a tank or hose rupture would not create a significant impact.

8.12.6 Fire and Explosion Risk

As shown in Table 8.12-6, many of the hazardous materials are non-flammable. Anhydrous ammonia, which constitutes the largest quantity of hazardous materials onsite (except for lubricating oil and the mineral oil in the transformers), is incombustible in its liquid state. Ammonia evaporating as a gas from a leak or spill of the anhydrous solution is combustible within a narrow range of concentrations in air. However, the evaporation rate is sufficiently low that the lower explosive limit (LEL) will not be reached. Formic acid is combustible, but it will only be onsite prior to initial startup. The lubrication oil, diesel fuel, and neutralizing amines are flammable and will be handled in accordance with a Hazardous Materials Business Plan (HMBP) to be approved by Fresno County. Hydraulic oil, which is classified as combustible, will also be handled in compliance with the HMBP. With proper storage and handling of flammable materials in accordance with the HMBP, the risk of fire and explosion at the generating facility should be minimal.

The natural gas that will provide CVEC with fuel for the combustion turbines, for duct firing, for the emergency generator, and for the auxiliary boilers is flammable and could leak from the supply line that brings gas from PG&E's main pipeline. The risk of leakage is the normal type of risk encountered with transmitting natural gas via pipeline. Proper design, construction, and maintenance of the line will minimize leaks and the risk of fire or explosion. The line will be buried primarily in or adjacent to roadways.

Hydrogen gas will be used for cooling the steam turbine generator. The gas will be stored onsite outdoors on a "tube" trailer, which consists of a number of individual horizontal pressure vessels (i.e., "tubes") mounted on a trailer. The tubes contain compressed hydrogen gas, not liquid hydrogen. Compressed hydrogen gas is flammable. Therefore, the tubes will be stored out of doors and will not be stored in the vicinity of any sources of ignition. Potential accidental release scenarios involve the leakage of hydrogen gas from its storage cylinders.

The closest fire station is the Fresno County Fire Station at 25101 West Morton Avenue in Tranquillity with stations at Mendota and Caruthers providing assistance in the event of a fire in the City of San Joaquin (Williams, 2001).

8.12.7 Cumulative Impacts

The primary potential cumulative impact from the use and storage of hazardous materials will be a simultaneous release from two or more sites of a chemical that will migrate offsite. Potentially, the two or more migrating releases could combine, thereby posing a greater threat to the offsite population than a single release by any single site. Hazardous materials that do not migrate, such as sulfuric acid, will not present a potential cumulative impact. The hazardous material with the potential to migrate offsite from CVEC is anhydrous ammonia. To determine the potential for cumulative impacts, other sites in the vicinity that store and use ammonia must be identified and analyzed. In addition, other chemicals in the vicinity with the ability to migrate offsite that could combine or interact with released ammonia must be identified and analyzed.

Numerous other facilities in Fresno County handle, store, emit, or release ammonia. Ammonia is an ingredient in fertilizer and is sometimes used for refrigeration, making it a fairly common chemical in an agricultural and food producing region, such as Fresno County. A number of fertilizer mixers, food processors, and vintners located within Fresno County reported releases of ammonia in 1999, under the USEPA's Toxic Release Inventory program. Most of these facilities were located in the City of Fresno, which is more than 30 miles from the proposed project site.

The closest facility of concern is RNA Corporation at 22312 Railroad Avenue in San Joaquin.[1] This facility mixes fertilizers and reported releases of small amounts of ammonia in 1998 and 1999 (less than 500 pounds). It is located approximately 1.4 miles from the proposed project site. Simultaneous releases from this facility and the proposed CVEC facility could cause cumulative impacts, if the migrating clouds merged. Other facilities in the regional area (between 5 and 10 miles from the project site) that store chemicals that could potentially migrate and make a minor contribution to a cumulative release. Such facilities include J.R. Simplot, which is located approximately 7 miles from the site at 12688 S. Colorado Avenue in Helm.

8.12.8 Proposed Mitigation Measures

The following subsections present measures that the Applicant would implement during project construction and operation phases to mitigate risks in handling hazardous materials, particularly the risk of inadvertent spills or leaks that might pose a hazard to human health or the environment.

8.12.8.1 Construction Phase

During facility construction, hazardous materials stored onsite will include small quantities of paints, thinners, solvents, cleaners, sealants, lubricants, and 5-gallon emergency fuel containers. This section describes measures that will be taken to mitigate potential risks from hazardous material usage. Paints, thinners, solvents, cleaners, sealants, and lubricants will be stored in a locked utility building. These materials will be handled per the manufacturers' directions and will be replenished as needed. The emergency fuel containers will be Department of Transportation (DOT)-approved, 5-gallon safety containers, secured to the construction equipment. The emergency fuel will be used only when regular vehicle fueling is unavailable.

Fuel, oil, and hydraulic fluids will be transferred directly from a service truck to construction equipment tanks and will not otherwise be stored onsite. Fueling will be performed by designated, trained service personnel either before or at the end of the workday. Service personnel will follow standard operating procedures (SOPs) for filling and servicing construction equipment and vehicles. The SOPs, which are designed to reduce the potential for incidents involving the hazardous materials, include the following:

- Refueling and maintenance of vehicles and equipment will occur only in designated areas that are equipped with spill control features (e.g., berms, paved surfaces, spill response kits, etc.).
- Vehicle and equipment service and maintenance will be conducted by authorized personnel only.
- Refueling will be conducted only with approved pumps, hoses, and nozzles.
- Catch-pans will be placed under equipment to catch potential spills during servicing.
- All disconnected hoses will be placed in containers to collect residual fuel from the hose.
- Vehicle engines will be shutdown during refueling.
- No smoking, open flames, or welding will be allowed in refueling or service areas.
- Refueling will be performed away from bodies of water to prevent contamination of water in the event of a leak or spill.
- When refueling is completed, the service truck will leave the project site.
- Service trucks will be provided with fire extinguishers and spill containment equipment, such as absorbents.

[1] Data obtained from USEPA's Envirofacts website at http://oaspub.epa.gov/ceppo.

- Should a spill contaminate soil, the soil will be put in containers for offsite disposal as a hazardous waste.
- All maintenance and refueling areas will be inspected monthly. Results of inspections will be recorded in a logbook that will be maintained onsite.

Small spills will be contained and cleaned up immediately by trained, onsite personnel. Larger spills will be reported via emergency phone numbers to obtain help from offsite containment and cleanup crews. All personnel working on the project during the construction phase will be trained in handling hazardous materials and the dangers associated with hazardous materials. An onsite health and safety person will be designated to implement health and safety guidelines and contact emergency response personnel and the local hospital, if necessary.

If a spill involves hazardous materials equal to or greater than the specific reportable quantity all federal, state, and local reporting requirements will be followed. The California Water Code (Section 13272(f)) establishes a reportable quantity of 42 gallons for spills of petroleum products in water bodies. However, the California Water Quality Control Board Region 5 has jurisdiction for the project site and they would like all oil spills affecting surface water to be reported. In the event of a fire or injury, the local fire department will be called (Fresno County Fire Station at Tranquillity).

8.12.8.2 Operation Phase

During CVEC operation, some hazardous and acutely hazardous materials will be stored onsite. Listed below are management and mitigation measures for minimizing the risks of hazardous material handling during facility operation.

8.12.8.2.1 Anhydrous Ammonia

The anhydrous ammonia storage and handling facilities will be equipped with continuous tank level monitors, temperature and pressure monitors and alarms, and excess flow and emergency block valves. Containment will be provided. If there is an inadvertent release from the storage tank, the liquid will be contained within the secondary containment structure. Vapor detection equipment will be installed to detect escaping ammonia and activate alarms and the automatic vapor suppression features.

8.12.8.2.2 Cyclohexylamine

Cyclohexylamine in the form of neutralizing amines will be fed into the condenser hotwell or condensate piping to control corrosion. The feed equipment will consist of a storage tank, pumps, leak detection system, alarm system, and fire detection and protection system. The chemical will be stored in containers of suitable size (e.g., 200- to 400-gallon totes) located in the Water Treatment Facility. The totes will be located above concrete, epoxy-lined containment areas with sufficient capacity to contain the full quantity of a tank in the event of a spill or tank rupture.

8.12.8.2.3 Sulfuric Acid

Sulfuric acid will be fed into the circulating water system in proportion to makeup water flow for alkalinity reduction; this will be done to control the scaling tendency of the circulating water within an acceptable range. The acid feed equipment will consist of an acid storage tank, chemical metering pumps, a leak detection system, and an alarm system. Two 8,000-gallon storage tanks will be located near the cooling tower circulating water pumps above a concrete epoxy-lined containment area; the area will have sufficient capacity to contain 8,000 gallons of sulfuric acid plus accumulated rainfall for 24 hours during a 25-year storm.

8.12.8.2.4 Hazardous Materials

Of the other hazardous materials that are continuously onsite, two merit additional discussion because of the quantity of material stored. Sodium hypochlorite will be added to the circulating water as a

biocide. The system will consist of an 8,000-gallon storage tank, chemical metering pumps, a leak detection system, an alarm system, and a fire detection and protection system. Sodium hydroxide will be used primarily to remove hardness in the reactor/clarifier softener. The system will consist of an 8,000-gallon storage tank, chemical metering pumps, and a leak detection and alarm system. Both tanks will be located above concrete containment areas with sufficient capacity to contain the full tank contents plus accumulated rainfall for 24 hours during a 25-year storm.

All hazardous materials will be handled and stored in accordance with applicable codes and regulations. All containers used to store hazardous materials will be inspected at least daily for signs of leaking or failure. Incompatible materials will be stored in separate storage and containment areas. Areas susceptible to potential leaks and/or spills will be paved and bermed. Containment areas may drain to a collection area, such as an oil/water separator or a waste collection tank. Piping and tanks will be protected from potential traffic hazards by concrete or pipe-type traffic bollards and barriers.

If a spill involves hazardous materials equal to or greater than the specific reportable quantity all federal, state, and local reporting requirements will be followed. The California Water Code (Section 13272(f)) establishes a reportable quantity of 42 gallons for spills of petroleum products in water bodies. However, the California Water Quality Control Board Region 5 has jurisdiction for the project site and they would like all oil spills affecting surface water to be reported.

A worker safety plan, in compliance with applicable regulations, will be implemented. It will include training for contractors and operations personnel. Training programs will include safe operating procedures, the operation and maintenance of hazardous materials systems, proper use of PPE, fire safety, and emergency communication and response procedures. All plant personnel will be trained in emergency procedures, including plant evacuation and fire prevention. In addition, designated personnel will be trained as members of a plant hazardous material response team; team members will receive the first responder and hazardous material technical training to be developed in the HMBP (Section 8.12.8.4). For large spills, cities and counties provide mutual assistance. Fire stations in Fresno County will be the backup responders.

8.12.8.3 Transportation/Delivery of Hazardous Materials

Hazardous and acutely hazardous materials will be delivered periodically to CVEC. Transportation will comply with the applicable regulations for transporting hazardous materials, including DOT, U.S. Environmental Protection Agency (USEPA), California Department of Toxic Substances Control (DTSC), CHP, and California State Fire Marshal. Under the California Vehicle Code, the CHP has the authority to adopt regulations for transporting hazardous materials in California. The CHP can issue permits and specify the route for hazardous material delivery. The key acutely hazardous material that will be delivered to CVEC is anhydrous ammonia, and the Vehicle Code has special regulations for the transportation of hazardous materials that pose an inhalation hazard (Vehicle Code Section 32100.5). These and other regulations concerning any of the other hazardous materials delivered to CVEC will be fully complied with. The route that will be used for trucks delivering anhydrous ammonia is described in Section 8.10.

8.12.8.4 Hazardous Materials Plans

Hazardous materials handling and storage, and training in the handling of hazardous materials will be set forth in more detail in hazardous materials plans that will be developed by the Applicant.

8.12.8.4.1 Hazardous Materials Business Plan

A Hazardous Materials Business Plan (HMBP) is required by Title 19 California Code of Regulations (CCR) and the Health and Safety Code (Section 25504). The plan will include an inventory and

location map of hazardous materials onsite and an emergency response plan for hazardous materials incidents. The topics to be covered in the plan are:

- Facility identification
- Emergency contacts
- Inventory information (for every hazardous material)
- Material Safety Data Sheets (MSDS) for every hazardous material
- Site map
- Emergency notification data
- Procedures to control actual or threatened releases
- Emergency response procedures
- Training procedures
- Certification

The HMBP will be filed with Fresno County, the designated CUPA for the project site.

8.12.8.4.2 Risk Management Plan/Process Safety Management Plan

A Risk Management Plan (RMP) is required for substances listed in 40 CFR Section 68.130 that exceed designated threshold levels. Because an acutely hazardous material will be stored and used at CVEC in quantities exceeding the threshold, an RMP will be required, in addition to an HMBP. The requirements for an RMP are found in 40 CFR 68 Subpart G and under California's Accidental Release Prevention Program (CalARP) pursuant to Health and Safety Code Sections 25331 through 25543.3. The California program is similar to the federal program but may be more stringent in some areas. There are three programs under 40 CFR 68 and the RMP requirements that increase in stringency from Program 1 to Program 3. Program 1 applies to facilities where, under a worst-case release assessment, the distance to any public receptor cannot fall within the toxic endpoint release concentration for ammonia of 0.14 mg/L of air. This is about 200 ppm at standard conditions for temperature and pressure. Program 3 applies where a chemical is stored at or above its threshold quantity (TQ). Program 2 is for facilities that do not fit into Programs 1 or 3. The TQ for anhydrous ammonia is 10,000 pounds under Federal regulations and 500 pounds under State regulations.

The RMP will be filed with the Fresno County Environmental Health Department, the designated CUPA for the project site. The RMP will cover acutely hazardous materials that can produce toxic clouds when inadvertently released. The RMP will include a hazard assessment to evaluate the potential effects of accidental releases; a program for preventing accidental releases; and a program for responding to accidental releases to protect human health and the environment.

The basic elements of an RMP are:

- Description of the facility
- Accident history of the facility
- History of equipment used at the facility
- Design and operation of the facility
- Site map(s) of the facility
- Piping and instrument diagrams of the facility
- Seismic analysis
- Hazard and operability study
- Prevention program
- Consequence analysis
- Offsite consequence analysis
- Emergency response

- Auditing and inspection
- Recordkeeping
- Training
- Certification

A Process Safety Management Plan (PSM) will be required under OSHA because the OSHA regulations require PSM for storage of anhydrous ammonia at quantities above 10,000 pounds. The requirements for a PSM are very similar to those for an RMP, but an offsite consequences analysis is not required for the PSM.

8.12.8.4.3 Spill Prevention Control and Countermeasure Plan

Federal and California regulations require a Spill Prevention Control and Countermeasures (SPCC) Plan if petroleum products above certain quantities are stored in aboveground storage tanks (AST). Both federal and state laws apply only to petroleum products that might be discharged to navigable waters. If stored quantities are equal to or greater than 660 gallons for a single tank, or equal to or greater than 1,320 gallons total, an SPCC Plan must be prepared. The key elements of an SPCC Plan are:

- Name, location, and telephone number of the facility
- Spill record of the facility and lessons learned
- Analysis of the facility, including:
  - Description of the facilities and engineering calculations
  - Map of the site
  - Storage tanks and containment areas
  - Fuel transfer and storage and facility drainage
  - Prediction and prevention of potential spills
- Spill response procedures
- Agency notification
- Personnel training and spill prevention

CVEC will store up to 30,000 gallons of turbine lubrication oil onsite. The nearest waterway is Fresno Slough, which is approximately 2 miles from the project site. Fresno Slough eventually empties into the Kings River. Due to the distance, the CVEC will not be required to prepare an SPCC Plan, unless the Regional Water Quality Control Board determines that a Plan is necessary.

8.12.8.5 Monitoring

An extensive monitoring program will not be required, because environmental effects during the construction and operation phases of the facility are expected to be minimal. However, sufficient monitoring will be performed during both of these phases to ensure that the proposed mitigation measures are complied with and that they are effective in mitigating any potential environmental effects.

8.12.9 Involved Agencies and Agency Contacts

Several agencies regulate hazardous materials, and they will be involved in regulating the hazardous materials stored and used at CVEC. At the federal level, the USEPA will be involved; at the state level, the California Environmental Protection Agency (CalEPA) will be involved. However, local agencies primarily enforce hazardous materials laws. For CVEC, the primary local agency with jurisdiction will be the Fresno County Environmental Health Department. The persons to contact are listed in Table 8.12-7.

TABLE 8.12-7
Agency Contacts for CVEC Hazardous Materials Handling

Issue	Agency	Address	Person Contacted	Title	Telephone
Hazardous Materials Business Plan and Risk Management Plan	Fresno County Environmental Health Department	1221 Fulton Mall, 3rd Floor P.O. Box 11867 Fresno, CA 93775-1867	Harry Yee	Hazardous Materials Specialist	559-445-3271
Fire Dept. Permits	Fresno County Fire Department	25101 West Morton Ave. Tranquillity, CA	Cary Williams	Captain	559-698-5500
Hazardous Materials Response[a]	Fresno County Emergency Response Team	—	—	—	911

[a] Emergency Response Team will respond to 911 calls for hazardous materials releases, but the site has to provide spill cleanup team or contractor

8.12.10 Permits Required and Permit Schedule

Fresno County requires the following permit listed in Table 8.12-8.

TABLE 8.12-8
Permits Required and Permit Schedule for CVEC Hazardous Material Handling

Permit	Schedule	Applicability	Agency Contact
Hazardous Materials Storage Permit	Prior to storage of hazardous materials at the site.	Requires that businesses obtain permits for hazardous materials storage.	Fresno County Environmental Health Dept. Harry Yee Hazardous Materials Specialist 1221 Fulton Mall, 3rd Floor P.O. Box 11867 Fresno, CA 93775-1867

8.12.11 References

City of San Joaquin, 2001. Initial Environmental Study – Southeast Area Annexation. May.

Lewis, Richard J. Sr. 1991. "Hazardous Chemical Desk Reference, 2nd Edition."

Marques, P. 2001. Telephone conversation with Pete Marques, Fresno County Fire Prevention, September 18.

U.S. Department of Health and Human Services, Public Health Service Centers for Disease Control. National Institute for Occupational Safety and Health. 1990. NOSH Pocket Guide to Chemical Hazards.

U.S. Environmental Protection Agency. 2001. Envirofacts Data Warehouse and Applications. URL: http//www.epa.gov/enviro. October 2.

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Yee, H. 2001. Telephone conversation with Harry Yee, Fresno County Environmental Health Department, May 25.

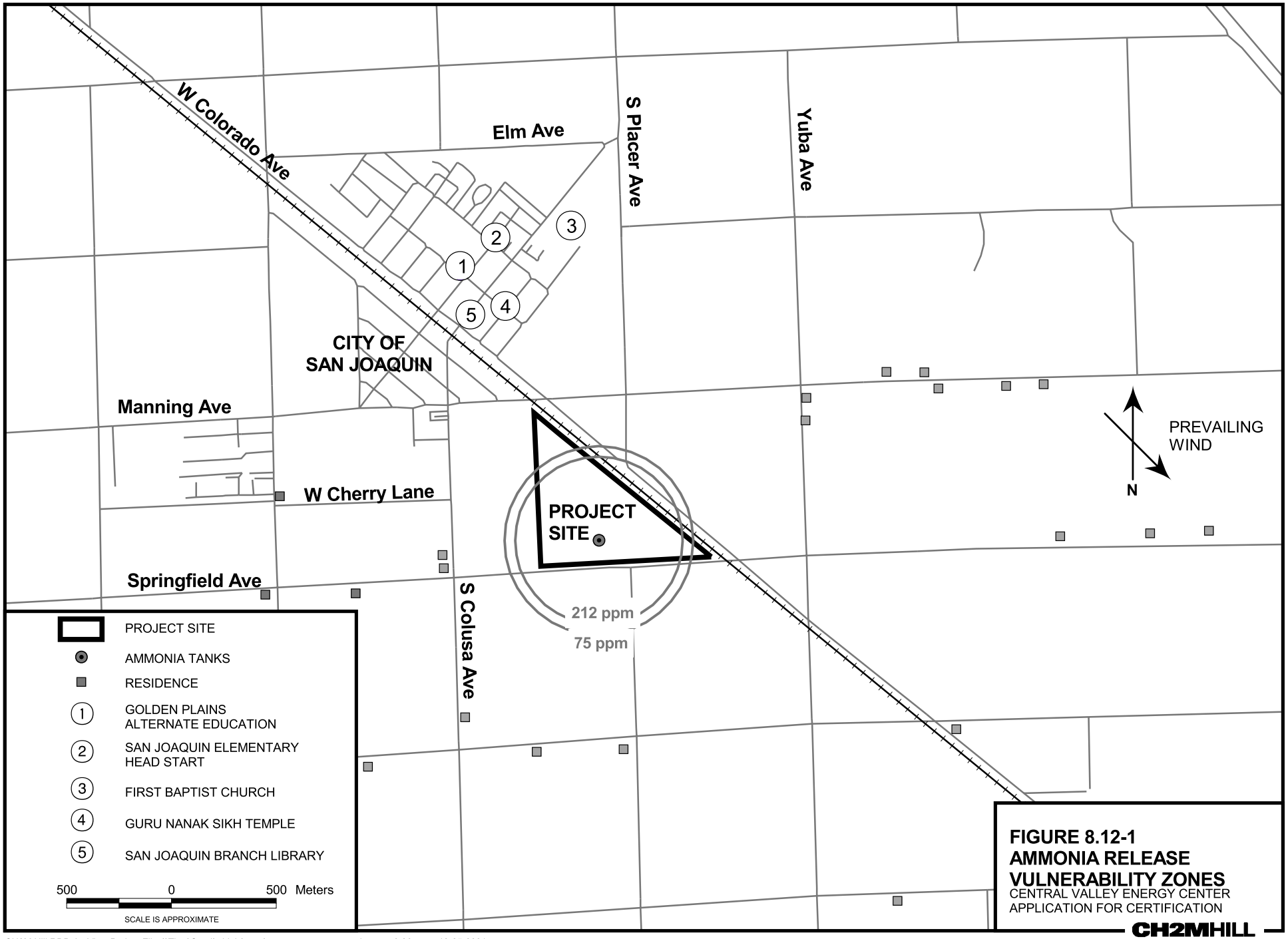

FIGURE 8.12-1
AMMONIA RELEASE VULNERABILITY ZONES
CENTRAL VALLEY ENERGY CENTER
APPLICATION FOR CERTIFICATION

CH2MHILL

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